CARING FOR "BIGFOOT"

The Caldera Next Door

Roughly 1.25 million years ago, a huge volcanic eruption showered a thick layer of ash and debris over northern New Mexico, smothering everything it landed on and transforming the landscape forever. Today, Los Alamos scientists are digging into the remains of that explosion to understand the sleeping giant in northern New Mexico's backyard.

Caldera is tremendous geologic resource

More than 300 times the size of the 1980 Mt. St. Helens eruption, the blast gave birth to a world-class caldera, the Valles Caldera. Its footprint includes the remains of more than a dozen separate volcanic episodes. One of these produced an eruption rivaling the one that buried Pompeii in 79 AD. Now set aside as a national trust, the caldera is an exceptional geologic resource that Los Alamos scientists are using to evaluate and predict volcanic hazards.

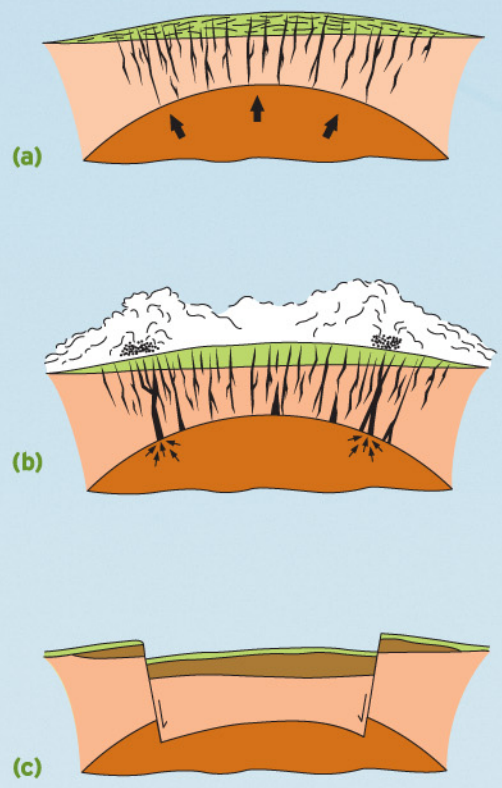
Team digs into Caldera's past

Los Alamos work focuses on understanding and exploring the life of the Caldera—the years of activity and dormancy recorded below its surface. Scientists literally dig into the mystery with picks and knives to expose and then geologically and geochemically analyze the layers of volcanic ash and debris. They also recover and record diatoms, small fossils that reveal the ebb and surge of lakes that periodically formed in the Caldera depression.

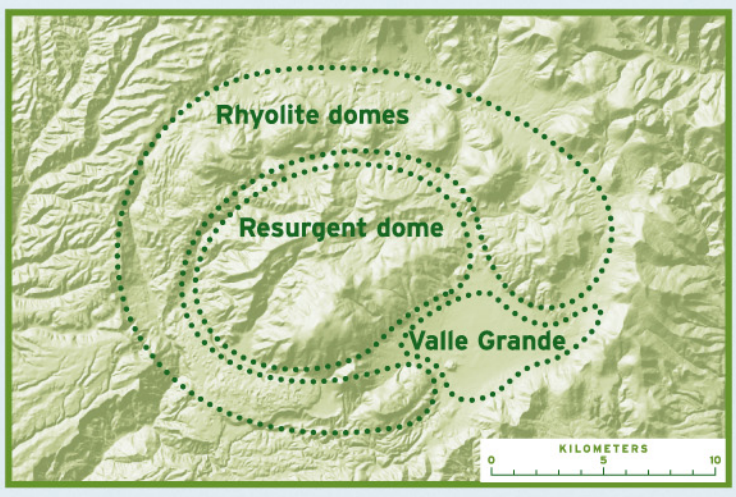
Modern scientific breakthroughs are often built on calculations and computer models; this team is using hands-on fieldwork to gain new insight into the age of the Caldera's eruptions, the geochemistry of its deposits, and its paleoenvironments.

Findings will help predict future activity

Understanding when and how violently the Caldera has erupted over time is critical to evaluating volcanic hazards today. Is a volcano sleeping or finally shut down forever? Scientists use their recorded data and recovered fossils to understand the cycles inherent in volcanic activity. This insight can help future generations continue to explore and protect the Valles Caldera and its buried secrets.



The Life of a Caldera
An enormous eruption vented vast amounts of volcanic debris (a, b). Next, a large low crater (a caldera) was formed and supported a large lake (c, d). A cycle of subsequent, periodic eruptions coupled with uplift (e, f) continued to add hills and valleys to the caldera floor.



The Valles Caldera's Footprint
The Caldera as viewed in a composite digital elevation model shows a ring of rhyolite domes (created by post-Caldera volcanic activity) that surround a central resurgent (structural) dome. The large, flat area that breaks the ring of rhyolite domes is the Valle Grande, the portion of the Valles Caldera preserve most visible to passersby.

Volcanic Strata
Pyroclastic fallout deposits from the youngest sequence of eruptions about 50,000 years ago are over 30 meters thick in the Caldera (for comparison, note size of person at upper left of photo). These eruptions were similar to those that buried Pompeii in 79 AD.

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Los Alamos National Laboratory is operated by the University of California for the United States Department of Energy under contract W-7405-ENG-36.
LALP 04-030